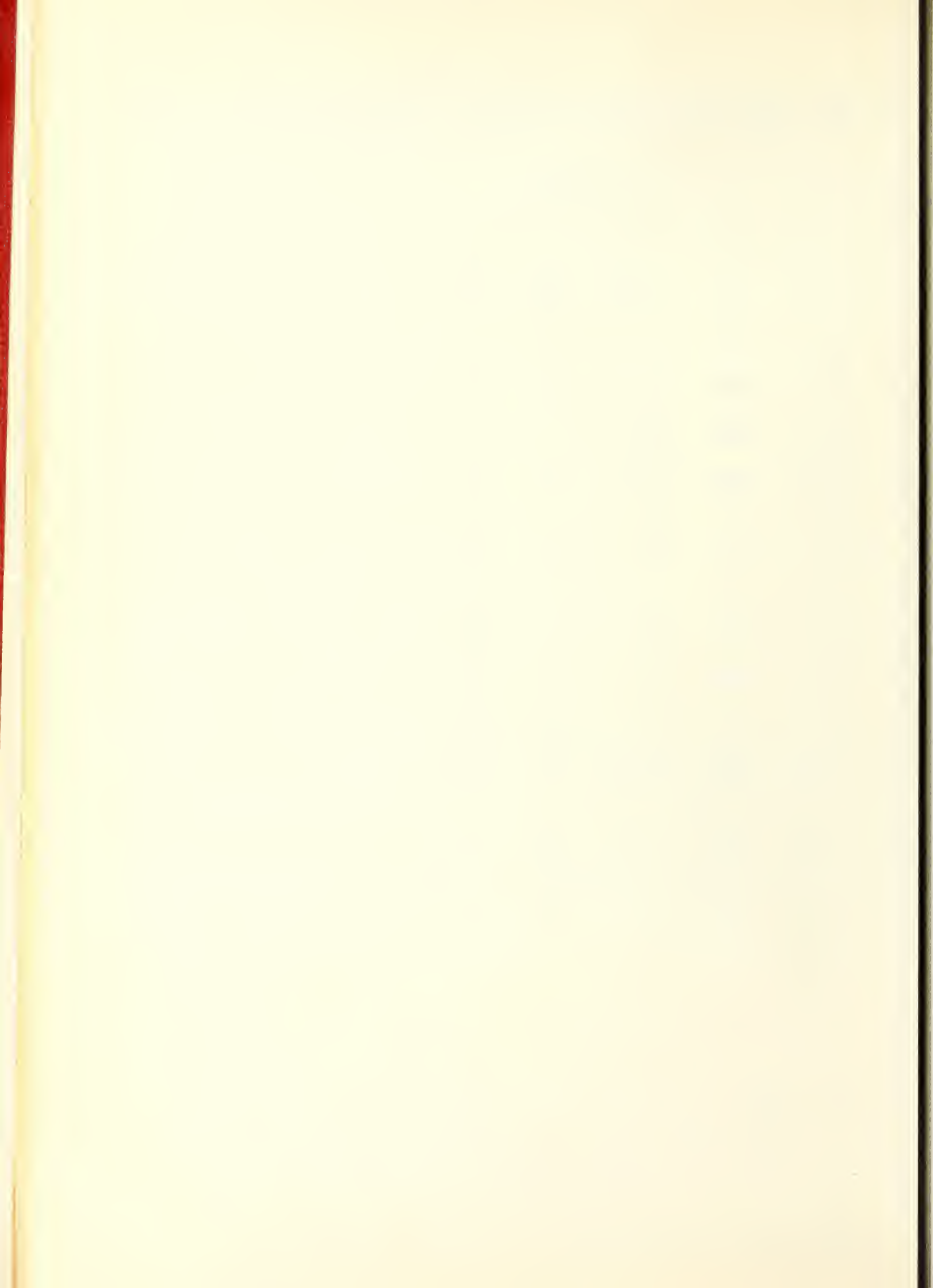


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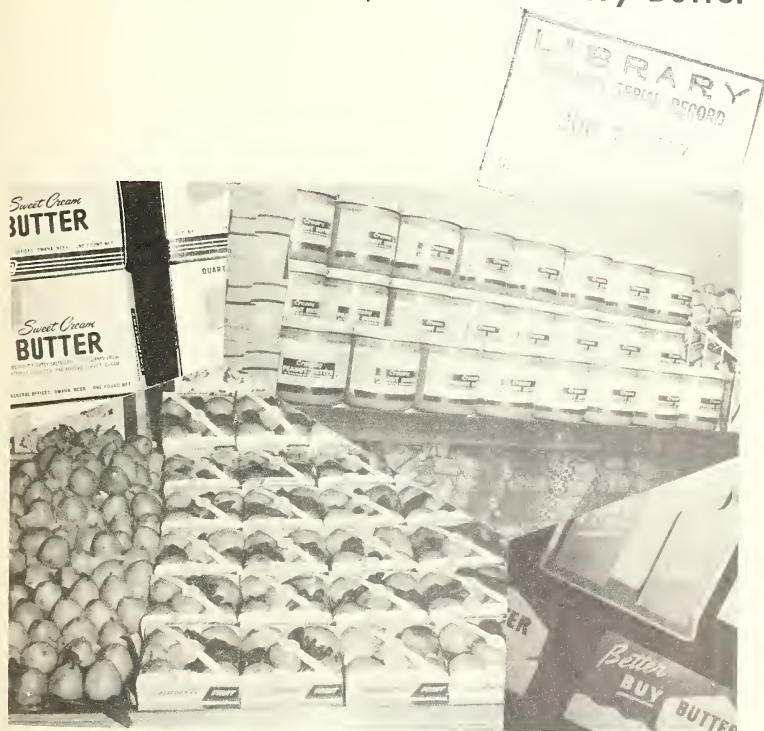
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Evaluation of

RETAIL MERCHANDISING PRACTICES

for

Pears, Peanut Butter, and Creamery Butter



Marketing Research Report No. 180

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Marketing Service
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George H. Goldsborough and William S. Hoofnagle assisted in the development of this research and were responsible for the overall supervision of the project.

June 1957

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EVALUATION OF RETAIL MERCHANDISING PRACTICES FOR--
Pears, Peanut Butter, and Creamery Butter

By
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Market Development Branch

SUMMARY

Controlled retail store experiments were carried out to measure the effect of specific merchandising practices on the sales of pears, creamery butter, and peanut butter in St. Louis, Mo., from January 16 through April 7, 1956.

Pears

The 8-week experiment evaluated the effect on the retail sales of pears of (1) pricing on a unit basis as opposed to pricing on a pound basis and (2) consumer acceptance of a new package designed for packaging at a central point in the marketing channel compared with acceptance of a package suitable for packaging only at the retail store level. In this experiment packaged pears were always displayed in combination with bulk.

Results of the research indicated that both of the pricing techniques tested and both of the packages tested may be equally acceptable to consumers. Package sales accounted for 51 percent of total sales.

Spoilage of pears during the experiment amounted to 10.5 percent of the pears handled. The greatest proportion of this spoilage, or 5 percent of the pears handled, occurred in bulk displays, and about 4-3/4 percent of the pears spoiled in the store before they were offered to consumers. About 3/4 of 1 percent of the pears handled spoiled in packages on display.

In a previous study conducted in Pittsburgh, Pa., in 1955, it was found, among other things, that sales of winter pears were increased when large pears were displayed with medium-sized pears. 2/ Since the present experiment indicates no statistically significant difference in sales between the unit-pricing and the pound-pricing techniques, retailers would probably prefer the pound-pricing technique because it would be less cumbersome to use for displays of different sizes of pears. 3/

Also, since differences in sales for the types of packages chosen were not significant, retailers could choose that type of package which offered the greatest economy in their total operation.

1/ Mr. Huelskamp resigned from the Department service on February 1, 1957.

2/ Smith, Hugh M., Clement, Wendell E., and Hoofnagle, William S., Merchandising Winter Pears in Retail Food Stores. U. S. Dept. Agr. Mktg. Res. Rept. 102, 17 pp., illus. September 1955.

3/ "No statistically significant difference" means that the relatively small differences in sales might have been caused by chance variation.

Peanut Butter

The 12-week experiment to determine the effect of location in the store on the sales of peanut butter indicated that the usual practice of displaying peanut butter alongside jams and jellies and the practice which displayed peanut butter with jams and jellies and with crackers were about equally acceptable to consumers. However, when peanut butter was displayed with jams and jellies and with cheese spreads, the sales were significantly lower than when either of the other techniques was used.

Creamery Butter

The 12-week butter experiment measured the effect of two types of in-store promotional materials on the retail sales of creamery butter. Results of the experiment indicated that neither of the specific promotions tested increased the demand for the product significantly. When in-store promotional materials were employed, total sales of butter were not significantly larger than when they were not used.

BACKGROUND

The trend in the retail grocery business toward larger self-service supermarkets has brought about many changes in merchandising practices. The consumers, in many instances, select their purchases without any contact with store personnel. Because of the large number of products available and the opportunity which consumers have to make their own selections, effective merchandising practices are a prerequisite for maintaining or increasing sales of specific products.

Industry groups realize that products must, in part, sell themselves at the retail level by being merchandised with the best practices of displaying, pricing, packaging, labeling, and advertising. As a result, many large business establishments throughout the United States have research departments or employ research agencies to collect and analyze information to answer specific marketing and merchandising problems involving their products.

Groups of producers, organized to alleviate problems within their industries, are also interested in determining proper merchandising practices to apply to their respective commodities. However, many of these groups do not have the necessary facilities to conduct marketing research. The Market Development Branch, Agricultural Marketing Service, has initiated a limited program to assist various industries with marketing problems.

This publication describes merchandising research conducted by the Market Development Branch in cooperation with a chain-store organization and other industry groups--American Dairy Association, Oregon-Washington-California Pear Bureau, and National Peanut Council--to determine the effect on retail sales of such factors as location of displays within the store, type of package, in-store promotions, and methods of pricing.

PEARS

This study supplements the research work on winter pears conducted in Pittsburgh, Pa., during 1955. ^{4/} The overall objective in both projects was to ascertain the most effective retail merchandising practices for fresh winter pears. The pear industry believes that the greatest opportunity for increasing the consumption of winter pears lies in expanding the market for fresh pears.

The trend toward prepackaging fresh fruits and vegetables has increased in the past few years. To date most of the prepackaging has been done in retail stores. Recently, however, interest has arisen in developing retail packages that could be filled rapidly by machinery at a central point in the marketing channel and would maintain the quality of the fruit in transit. Part of the research for this report was designed to evaluate consumers' preference between 2 packages--1 for packaging winter pears at a central point and 1 normally used for packaging pears in the store.

In addition, this research measured the effect on the sales of pricing winter pears by the unit as opposed to pricing on a pound basis. This particular phase of research on winter pears was conducted during the spring of 1956.

Procedure

The winter pear experiment was conducted in 12 stores over an 8-week period. The methods tested to measure the effect of the two packages and pricing techniques are listed below.

- A. A tray of 5 pears with a cellophane overwrap displayed in combination with bulk and priced on a unit basis.
- B. A box of 5 pears with a cellophane window displayed in combination with bulk and priced on a unit basis.
- C. A tray of 5 pears with a cellophane overwrap displayed in combination with bulk and priced on a pound basis.
- D. A box of 5 pears with a cellophane window displayed in combination with bulk and priced on a pound basis.

The box was designed for rapid packaging at a central point in the marketing channel and had a cardboard cover to protect the fruit in transit. However, for this experiment all packaged pears were packed in the retail store. When the winter pears were ready to be placed on display, two triangular cardboard pieces covering the top of the box were torn along perforated creases to permit consumers to see the contents of the package.

^{4/} See footnote 2.

All the pears offered for sale (either in bulk or in package) throughout the experiment were size 90 (90 pears per shipping box). The total price for 5 pears was 45 cents; it was expressed as 5 for 45 cents with a unit price display and 2 pounds for 45 cents with a pound price display.

The research was carried out by controlled experimentation, and the size and location of the displays were held constant throughout the experiment. The methods were rotated equally among the 12 stores every 2 weeks so that all the methods were tested simultaneously, and every store tested each of the 4 methods for 2 weeks during the 8-week period.

Results

Results of this research indicated that the packages seemed to be about equally acceptable to consumers who prefer to buy prepackaged winter pears. This was borne out by the fact that sales of winter pears packed in the tray with a cellophane overwrap and those in the box designed for rapid packaging at a central point were not significantly different at the 5-percent level. In other words, there is no definite evidence that the observed differences in sales were caused by anything more than chance variation. The following tabulation shows the quantity of packaged winter pears sold by specified methods in 12 food chain stores, in St. Louis, Mo., during 8 test weeks from February 6 to March 31, 1956:

<u>Merchandising method</u>	<u>Quantity sold</u> <u>Pounds</u>
A. Tray package, cellophane overwrap, with unit price in combination with bulk.....	2,693
B. Box package with unit price in combination with bulk.....	2,468
C. Tray package, cellophane overwrap, with pound price in combination with bulk.....	2,477
D. Box package with pound price in combination with bulk.....	2,271

Additional analysis of the data indicated that differences in total pounds sold by methods other than the usual method (tray package, cellophane overwrap, with unit price in combination with bulk) would have had to be at least 18.1 percent larger or smaller in order to demonstrate any advantage of one technique over the other. The maximum observed difference was 16 percent.

Bulk pears were always displayed with the packaged pears. During the 8-week experiment, pears sold in packages comprised 51 percent of the total pounds sold and bulk pears accounted for the rest. The statistical analysis indicated the difference between the total pounds of pears sold in bulk was not significant when bulk pears were offered with either package.

The second factor studied in the experiment was pricing on a unit basis versus pricing on a pound basis. Many retailers believe that sales of certain items can be increased by pricing either on a unit or pound basis, depending on the product. Usually, pears are priced on a unit basis at the retail level. The results of the experiment indicate that pricing on a pound basis in the St. Louis market is just as acceptable to consumers as pricing on a unit basis.

Pricing on a unit basis tends to limit retailers to offering consumers pears of only one size, as was also done in this experiment for control purposes. Naturally, if the retailer is going to have a fixed price for each pear, displaying only one size reduces the work of the manager in fixing prices and the problems of the check-out clerk. In addition, pears priced on a unit basis require a separate display for each size. An earlier study indicates, however, that more pears can be sold if consumers can select from a variety of sizes. 5/

Although subsequent observations may show that it would be somewhat more effective in terms of sales volume for retailers to use one method than the other, data from the present survey are not adequate to measure differences of relatively small proportions. In light of any definite information to the contrary, retailers would probably prefer to use the pound-pricing technique, because it would be less cumbersome to display and price pears of various sizes.

Spoilage

Loss of pears by spoilage during the experiment amounted to 10.5 percent of the pears received in the 12 stores (fig. 1). This $10\frac{1}{2}$ percent loss consisted of 5 percent in bulk display, about $4\text{-}3/4$ percent before the pears were placed on display, and about $3/4$ of 1 percent in packages on display.

Maintaining the quality of agricultural commodities is essential to an efficient marketing system. The economic waste caused by spoilage should encourage marketing practices that minimize such losses. It appears from this and other research that prepackaging helps to maintain the quality of produce. 6/

PEANUT BUTTER

The peanut industry, faced with marketing quotas and acreage allotments, is striving to expand the market for peanuts and peanut products. Peanut butter, one of the major uses of peanuts, with national distribution and wide

5/ See footnote 2.

6/ Hardenburg, R. E. How to Get the Most from a Package. Market Growers' Jour. 81(8): 10-11. August 1952.



Figure 1

consumer acceptance, is believed to be one of the products in which consumption can be increased. In this connection, representatives of the industry are vitally interested in determining the effect of retail merchandising practices on the sales of and consumer demand for peanut butter.

The purpose of this research was to determine the effect that location of peanut butter in the retail store might have on total sales of the product. During this experiment, peanut butter was displayed with cheese spreads and with crackers in addition to its usual location alongside jams and jellies. The additional locations were selected on the basis of two hypotheses: (1) That to increase sales, peanut butter should also be displayed with a product priced more competitively, such as cheese spreads, and (2) that the sales of peanut butter might be increased by displaying the product with a complementary item, such as crackers. It was also felt that displaying peanut butter in more than one location in the store should encourage impulse buying, assuming the product is an impulse item. 7/

7/ An "impulse item" means a product bought on the impulse rather than by plan.

Procedure

The experimental displays were as follows:

- A. Peanut butter displayed only with jams and jellies (the usual procedure in all stores in the experiment).
- B. Peanut butter displayed with jams and jellies, with an additional display with cheese spreads.
- C. Peanut butter displayed with jams and jellies, with an additional display with crackers.

The additional displays did not add to the overall space devoted to peanut butter, but were merely relocations of a part of the normal display space allotted to the product in each store. The size of the additional displays was approximately 20 percent of the total space devoted to peanut butter. These displays were comprised of one brand, which was the store's leading seller.

The usual display of peanut butter consisted of about 25 rows; the supplementary displays varied among stores from 5 rows to 8 rows of shelf facings, with a corresponding reduction in the size of the usual display when methods B and C were used.

The experiment was carried out under controlled conditions in 12 retail supermarkets during a 12-week period, from January 16 through April 7, 1956. A rotational type of design was used, which allowed testing of each method in every store for 4 weeks; prices of peanut butter were the same in all stores. During each 4-week period, 4 stores employed method A, 4 stores method B, and 4 stores method C. At the end of each 4-week period, the methods were rotated among the stores so that each store tested a different method in each time period.

Results

The data indicated that total sales of peanut butter were not increased by having the product displayed along with either cheese spreads or crackers. The quantity of peanut butter sold by specified methods in 12 food chain stores in St. Louis, Mo., during the 12 test weeks is shown below:

<u>Merchandising method</u>	<u>Quantity sold</u> <u>Pounds</u>
A. All peanut butter displayed with jams and jellies....	8,504
B. Leading brand displayed with cheese spreads and the other brands displayed with jams and jellies.....	<u>1/</u> 7,538
C. Leading brand displayed with crackers and the other brands displayed with jams and jellies.....	8,232

1/ The difference in average sales between this method and method A is statistically significant at the 5-percent level.

Differences in total sales were slight between methods A (displayed only with jams and jellies) and C (displayed also with crackers). However, the statistical analysis indicated that the sales from each of these two methods were significantly larger than from the method which displayed peanut butter with jams and jellies and cheese spreads.

Additional analysis of the data indicated that differences in total pounds sold by methods other than the usual one (peanut butter displayed only with jams and jellies) had to be at least 8.8 percent larger or smaller in order to provide definite evidence of any advantage of one method over the other. The total pounds sold by method B were 11.4 percent smaller than those sold by the usual method.

Peanut butter apparently cannot be classified as an impulse item, at least not when merchandised in the usual way. New merchandising devices should not be ruled out, however, as means of stimulating sales.

CREAMERY BUTTER

The dairy industry has embarked on an expanded program of advertising and other promotional activities to increase the sales of dairy products.

The purpose of this research was to measure the relative effect on the retail sales of creamery butter of two types of in-store promotional materials. The materials tested were based on two approaches to advertising butter in retail food stores: (1) Directing in-store promotion at butter only, with two slogans "Better Buy Butter" and "Better With Butter", and (2) an overall promotion of dairy products, with some specific mention of butter, but employing the central theme "Dairy Foods Festival."

Procedure

The experiment on the in-store promotion of butter was conducted in 12 stores over a 12-week period, from January 16 through April 7, 1956. The three alternative methods tested were:

- A. Overall promotion of dairy products with some specific mention of butter and employing the theme "Dairy Foods Festival."
- B. Promotion of butter alone with the slogans, "Better Buy Butter" and "Better With Butter."
- C. No promotion.

The overall promotion of dairy products consisted of "shelf talkers" (cardboard carrying slogans) placed throughout the store on the shelves containing commodities with which dairy products could be used. In most instances the shelf talkers tied in a specific dairy product with a related item; in others the talkers dealt with dairy foods in general (fig. 2). In addition, banners were hung across the store featuring a picture of dairy products, such as butter, milk, cheese, and ice cream, and carrying the theme "Dairy Foods Festival."

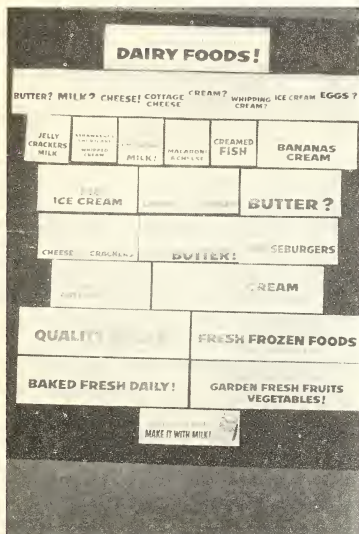


Figure 2.--"Shelf talkers" used in overall promotion of dairy products in St. Louis, Mo., from January 16 through April 7, 1956.

The promotion directed toward butter alone consisted of two shelf-talkers, "Better With Butter" and "Better Buy Butter." The "Better With Butter" talkers were distributed throughout the store on shelves of various commodities, the flavor of which might be enhanced by using butter (fig. 3). "Better Buy Butter" talkers and recipes in which butter was an ingredient were placed around the dairy case.

The data were collected by controlled experiment; provision was made for measuring carryover effects of the different practices from period to period. The size and location of displays were held constant throughout the experiment and prices were the same in all stores. During the first 2 weeks, 4 stores used method A; 4 stores, method B; and 4 stores, method C. At the end of 2 weeks the methods were rotated among the 12 stores so that different stores used different methods during the second

and third 2-week periods. After 6 weeks the methods had been rotated once; then they were rotated again over the following 6 weeks to increase the statistical efficiency of the experiment.

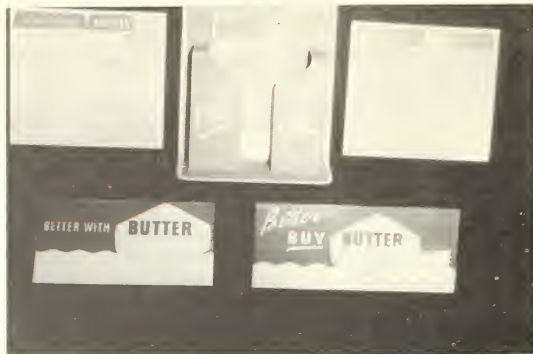


Figure 3.--"Shelf talkers" and recipes used in the promotion of butter in St. Louis, Mo., January 16, through April 7, 1956.

Results

Analysis of the data indicated that the particular in-store promotional materials used in the experiment had a moderate, but not significant, effect on retail sales of butter (see tabulation). The overall promotion of dairy products resulted in higher sales of butter during both 6-week periods than the method using the slogans, "Better With Butter" and "Better Buy Butter," or no promotion. The actual difference in sales between the overall promotion and the other methods averaged approximately $\frac{1}{4}$ percent; however, this difference was not statistically significant at the 5-percent significance level and could have resulted from chance variation.

Additional analysis of the data indicated that differences in total pounds sold by methods other than the usual method, that is, "no promotion," would have had to be at least 5.8 percent larger or smaller in order to provide definite evidence of any advantage of one method over the other.

The quantity of butter sold by specified methods in the 12 experimental stores during the 12 test weeks are shown in the following tabulation:

<u>Merchandising method</u>	<u>Quantity sold</u> <u>Pounds</u>
A. Overall promotion of dairy products with the theme "Dairy Foods Festival":	
First 6-week period.....	13,464
Second 6-week period.....	<u>14,060</u>
Total.....	<u>27,524</u>
B. Promotion only of butter with the slogans "Better Buy Butter" and "Better With Butter":	
First 6-week period.....	12,880
Second 6-week period.....	<u>13,562</u>
Total.....	<u>26,442</u>
C. No promotion:	
First 6-week period.....	13,066
Second 6-week period.....	<u>13,295</u>
Total.....	<u>26,361</u>

While differences between the effect of the two sets of promotional materials were not statistically significant, the materials using the theme "Dairy Foods Festival" tended to effect the sales of butter more than the materials promoting butter only. Perhaps the suggestions "Better Buy Butter" and "Better With Butter" merely remind the consumers to purchase the product that they normally use in the home. The theme "Dairy Foods Festival" might, on the other hand, remind buyers that butter is a dairy food.

The in-store promotions in this research were not supported by special local advertising by radio, television, newspapers, or any other media.

METHODOLOGY

The experimental design used for these studies was the basic rotational latin square. ^{8/} A 4 x 4 design was used for the pear experiment, which was conducted over an 8-week period. A 3 x 3 design was used for the 12-week test period on creamery butter and peanut butter; however, the design for creamery butter also contained application of a double changeover design to measure carryover effects of the different practices. The merchandising practices for each of the commodities tested were rotated among the experimental stores so that every practice was tested in the same number of stores in each time

^{8/} Snedecor, George W. Statistical Methods. The Iowa State College Press, Ames, Iowa, 1948, pp. 271-85.

period and once in each store during the course of the research, with the exception of the creamery butter test. In the creamery butter test each practice was tested twice in each store. Rotating the practices among stores and over a period of time minimized the effects of nontest variables such as size and type of store, different income areas, seasonality of demand, competition from other products, and competition from neighboring stores not in the study. The coordination of the retailing practices for all stores was possible because the stores were under the same chainstore management.

Enumerators were assigned to the stores and were responsible for maintaining the displays for each merchandising practice. In addition, they collected records of daily receipts, beginning and ending inventories, spoilage, and other data, including cash register readings for determining the potential number of customers exposed to the merchandising practices being tested.

The analysis of variance technique was used in analyzing data to obtain and assign the existing variation to specific components. In these experiments the components were stores, time periods, merchandising practices, and experimental error. The significance or nonsignificance of each component was ascertained by determining the ratio of the mean square of each component to the appropriate error term. Variations attributable to each of the components in the pear and peanut butter experiments are indicated in tables 1 and 2, respectively.

The butter experiment was designed to measure residual effects, as well as differences in sales resulting from different merchandising practices (table 3). Separate analyses were made, ignoring residual effects and adjusting for residual effects, both types of analyses using logarithms of the original data. Table 4 indicates the analysis of variance, ignoring carryover. The effect of the adjustment for carryover was negligible so its results are not presented here inasmuch as the analysis is quite involved.

The treatments (adjusted or not) show remarkably little difference, as is reflected in the analysis of variance treatments component (0.00119) being even less than the intra-group error 0.00174. The standard error of an unadjusted treatment mean (in terms of logarithms) is 0.0085 and for the difference between 2 such means 0.0120.

Table 1.--Analysis of variance table for determining significance of effect of stores, time periods, and treatments on the quantity of packaged winter pears sold in 12 retail food chain stores, St. Louis, Mo.

Source of variation	Degrees of freedom	Mean square
Weeks.....	3	9,100
Stores.....	11	18,556
Between groups.....	2	41,453
Within groups.....	9	13,468
Treatments.....	3	2,477
Weeks x groups.....	6	1,075
Treatments x groups.....	6	1,268
Error.....	18	2,475

Table 2.--Analysis of variance table for determining significance of effects of stores, time periods, and treatments on the quantity of peanut butter sold in 12 retail food chain stores, St. Louis, Mo.

Source of variation	Degrees of freedom	Mean square
Weeks.....	2	2,110
Stores.....	11	130,447
Between groups.....	3	89,639
Within groups.....	8	145,750
Treatments.....	2	20,678
Weeks x groups.....	6	4,359
Treatments x groups.....	6	9,526
Error.....	8	5,903

Table 3.--Experimental design for butter, St. Louis, Mo., 1/

Time periods	Group I			Group II			Group III			Group IV		
	Stores			Stores			Stores			Stores		
	1	2	3	4	5	6	7	8	9	10	11	12
1	A	B	C	A	B	C	A	B	C	A	B	C
2	C	A	B	B	C	A	C	A	B	B	C	A
3	B	C	A	C	A	B	B	C	A	C	A	B
4	A	B	C	A	B	C	A	B	C	A	B	C
5	C	A	B	B	C	A	C	A	B	B	C	A
6	B	C	A	C	A	B	B	C	A	C	A	B

1/ Code letters refer to merchandising practices as follows:

- A. Dairy festival promotion
- B. Slogans displayed
- C. No promotion

Table 4.--Analysis of variance ignoring carryover effects on the quantity of butter sold in 12 retail food chain stores, St. Louis, Mo. 1/

Source of variation	Degrees of freedom	Sum of squares	Mean square
Repetitions	1	.000,000,027	
Stores	11	.84941	.07722
Between groups	3	.07920	.02640
Within groups	8	.77021	.09628
Treatments	2	.002384	.00119
Periods in repetitions	4	.64679	.16170
Intra-group error	16	.02790	.00174
Repetitions x groups	3	.00552	.00184
Treatments x groups	6	.01516	.00253
Periods in repetitions x groups	12	.12773	.01064
Treatments x repetitions	2	.003433	.00172
Treatments x repetitions x group	6	.01075	.00179
Stores in groups x repetitions	8	.02137	.00267

